

REMARKS

Applicant respectfully requests reconsideration and allowance of the subject application. Claim 2 has been canceled. Claims 1 and 3-34 are pending, of which claims 1, 3-5, 7, 9-11, 17, 29, and 31-32 have been amended.

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Drawing Objections

The drawings are objected to under 37 C.F.R. 1.83(a) and the Office states that the drawings must show every feature of the invention specified in the claims (*Office Action* p.2).

10 A. The Office concludes that “therefore, the first configuration and the second configuration must be shown in the same figure”. Applicant disagrees with this assumption and requests that the Examiner point out where this “same figure” requirement can be located in the MPEP.

15 To further prosecution, however, the Office may be referring to at least claim 1 which recites a configurable H-bridge circuit comprising “a first configuration of the high switch and the low switch connected together and coupled to drive a motor”, and “a second configuration in which the high switch and the low switch are each configured as a discrete switch”.

20 Fig. 1 (i.e., Figs. 1A and 1B) clearly illustrates a configurable H-bridge circuit 100 comprising a first configuration (Fig. 1B) of the high switch 102(1) and the low switch 102(3) connected together and coupled to drive a motor 116, and a second configuration (Fig. 1A) in which the high switch 102(1) and the low switch 102(3) are each configured as a discrete switch. Accordingly, the first configuration and the second configuration are shown in the same
25 figure and Applicant requests that the drawing objection be withdrawn.

 Additionally, The Office may be referring to at least claim 4, for example, which recites an ASIC comprising “a configurable first H-bridge

circuit that includes a first configuration as a first motor drive circuit to drive a first motor, and includes a second configuration as discrete switches”.

Fig. 2 clearly illustrates an ASIC 200 comprising a configurable H-bridge circuit 202(2) or 202(3) that includes a first configuration 202(2) as a motor drive circuit to drive a motor 206, and includes a second configuration 202(3) as discrete switches 208(1-4). Again, the first configuration and the second configuration are shown in the same figure and Applicant requests that the drawing objection be withdrawn.

B. The Office states that the means to drive the first motor is a second H-bridge and the means to drive the second motor is a third H-bridge must be shown. Presumably, the Examiner is referring to claim 32, for example. Claim 9 recites similar feature(s). Independent claim 4 and dependent claim 9, and independent claim 31 and dependent claim 32 are amended herein to clarify which of the H-bridge circuit(s) are configured as a motor drive circuit to drive which motor.

In addition, Fig. 2 clearly illustrates configurable H-bridge circuits 202(1-3), any of which may be a first, second, and/or third motor drive circuit, or means, to drive a motor. Any of the configurable H-bridge circuits 202(1-3) may also be configured as discrete switches. Accordingly, the means to drive the first motor and the means to drive the second motor are shown and Applicant requests that the drawing objection be withdrawn.

35 U.S.C. §112 Claim Rejections

Claims 1-9 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite (*Office Action* p.3). Specifically, the Office states that claims 1 and 4 recite “can be” which renders the claims indefinite. Claims 1 and 4 are

amended herein for clarification and Applicant requests that the §112 rejection of claims 1-9 be withdrawn.

5 Claim 9 is rejected under 35 U.S.C. §112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements (*Office Action* p.3). Specifically, the Office questions how a second H-bridge can be claimed if there is no first H-bridge previously claimed. Independent claim 4 and dependent claim 9 are amended herein to clarify which of the H-bridge circuit(s) are configured as a motor drive circuit to drive which motor. Accordingly, Applicant requests that the §112 rejection of
10 claim 9 be withdrawn.

Claims 1-16 and 29-34 are rejected under 35 U.S.C. §112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements (*Office Action* p.3). Specifically, the Office states that a structural cooperative relationship of the first configuration and the second
15 configuration has been omitted.

 Applicant respectfully disagrees because both the first configuration and the second configuration include the same high and low switches – there is no structural relationship to be omitted. The same high and low switches can be implemented as a first configuration that includes a motor driven by the high
20 and low switches, or the same high and low switches can be implemented as a second configuration in which the high and low switches are implemented as discrete switches (*see* Figs. 1A and 1B and claims 1, 4, 10, 29, and 31, for example). Accordingly, Applicant requests that the §112 rejection of claims 1-16 and 29-34 be withdrawn.

25 Claims 17-28 are rejected under 35 U.S.C. §112, second paragraph, as being incomplete for omitting essential steps that amounts to a gap between the steps (*Office Action* p.4). Specifically, the Office states that the omitted steps

are “coupling the H-bridge as a component switch”, and “coupling the H-bridge to drive a motor”.

Applicant disagrees because independent claim 17 does in fact recite the steps that the Office indicates as being omitted, and independent claim 23
5 recites similar steps. Accordingly, the §112 rejection of claims 17-28 should be withdrawn.

35 U.S.C. §102 Claim Rejections

Claims 1-7, 17-22, and 29-30 are rejected under 35 U.S.C. §102(e) as
10 being anticipated by U.S. Patent No. 6,747,300 to Nadd et al. (hereinafter, “Nadd”) (*Office Action* p.4). Applicant respectfully traverses the rejection.

Claim 1 recites a configurable H-bridge circuit comprising “a first configuration of the high switch and the low switch connected together and
15 coupled to drive a motor”, and “a second configuration in which the high switch and the low switch are each configured as a discrete switch where the high switch is coupled as a first component switch to a component and the low switch is coupled as a second component switch to a different component, the second configuration being different than the first configuration.”

20 Nadd does not show or disclose a configurable H-bridge circuit comprising the first and second configurations, as recited in claim 1. Nadd only describes an H-bridge circuit for a d-c motor that consists of two high side MOSFETs and two low side MOSFETs (*Nadd* Abstract; col.1, line 54 to col.2, line 10).

25 The Office cites Nadd which indicates that an H-bridge circuit can be used in other applications, for example driving linear solenoids and other loads (*Office Action* p.5; *Nadd* col.3, lines 2-7). However, Nadd does not show or

disclose a configuration in which the high switch and the low switch are each configured as a discrete switch and coupled to different components, as recited in claim 1.

Accordingly, claim 1 along with dependent claim 3 is allowable over
5 Nadd and Applicant respectfully requests that the §102 rejection be withdrawn.

Claim 4 recites an ASIC comprising “a configurable first H-bridge circuit that includes a first configuration as a first motor drive circuit to drive a first motor, and includes a second configuration as discrete switches, each of
10 the discrete switches configured to be coupled to independent components”, and “a configuration register configured to maintain an indicator of the configurable first H-bridge circuit configuration.”

As described above in the response to the rejection of claim 1, Nadd does not show a configurable H-bridge circuit that includes a first configuration
15 as a motor drive circuit to drive a motor, and includes a second configuration as discrete switches, each of the discrete switches configured to be coupled to independent components, as recited in claim 4.

Further, Nadd does not show or disclose an ASIC that comprises a configurable H-bridge circuit and a configuration register, as recited in claim 4.
20 The Office cites Nadd for a component (80) in Fig. 8 that maintains an indicator of the configurable H-bridge circuit configuration (*Office Action* p.5). Applicant disagrees that component (80) is a configuration register because component (80) in Nadd Fig. 8 is described as a micro controller that provides a clockwise control signal output and a counter-clockwise control signal output
25 to rotate the motor (*Nadd* col.6, lines 34-42). Nadd does not show or describe a configuration register, as recited in claim 4.

Accordingly, claim 4 is allowable over Nadd and the §102 rejection should be withdrawn.

Claims 5-7 are allowable by virtue of their dependency upon claim 4.

5 Additionally, some or all of claims 5-7 are allowable over Nadd for independent reasons. For example:

Claim 5 recites that “the configuration register maintains the indicator that the configurable first H-bridge circuit is configured as the discrete switches.” The Office merely cites the same directional motor controller (80) shown in Nadd Fig. 8. As described above in the response to the rejection of claim 4, there is no indication in Nadd of a configuration register, and there is no indication that an H-Bridge circuit is configured as the discrete switches, as recited in claim 5. Accordingly, claim 5 is allowable over Nadd and the §102 rejection should be withdrawn.

15 Claim 6 recites that “the configuration register is further configured to maintain a switch indicator that indicates a configuration of a discrete switch.” Again, the Office merely cites the directional motor controller (80) shown in Nadd Fig. 8. However, there is no indication in Nadd of a configuration register that indicates a configuration of a discrete switch, as recited in claim 6.

20 Accordingly, claim 6 is allowable over Nadd and the §102 rejection should be withdrawn.

Claim 17 recites a method comprising “writing an indicator to a configuration register to indicate an implementation of a configurable H-bridge circuit as at least one of a motor drive circuit or as discrete switches”.

As described above in the response to the rejection of claim 4, Nadd does not show or disclose “a configuration register to indicate an

implementation of a configurable H-bridge circuit as at least one of a motor drive circuit or as discrete switches”, as recited in claim 17. The Office cites the directional motor controller (80) shown in Nadd Fig. 8, and cites to a section of Nadd that describes motor control modes (*Office Action* p.6; *Nadd* 5 col.4, line 49 to col.5, line 25). However, there is nothing described in the cited section of Nadd that would indicate an implementation of a configurable H-bridge circuit as at least one of a motor drive circuit or as discrete switches, as recited in claim 17.

Accordingly, claim 17 along with dependent claims 18-22 are allowable 10 over Nadd and the §102 rejection should be withdrawn.

Claim 29 recites one or more computer-readable media comprising computer executable instructions that, when executed, direct a printing device to “write an indicator to a configuration register to indicate a configuration of a 15 configurable H-bridge circuit as at least one of a motor drive circuit or as discrete switches”.

As described above in the response to the rejection of claims 4 and 17, Nadd does not show or disclose “a configuration register to indicate a configuration of a configurable H-bridge circuit as at least one of a motor drive 20 circuit or as discrete switches”, as recited in claim 29. The Office cites the directional motor controller (80) shown in Nadd Fig. 8, and cites to a section of Nadd that describes motor control modes (*Office Action* pp.5-6; *Nadd* col.4, line 49 to col.5, line 25). However, there is nothing described in the cited section of Nadd that would indicate an implementation of a configurable 25 H-bridge circuit as at least one of a motor drive circuit or as discrete switches, as recited in claim 29.

Accordingly, claim 29 along with dependent claim 30 is allowable over Nadd and the §102 rejection should be withdrawn.

35 U.S.C. §103 Claim Rejections

5 **A.** Claims 8-9 are rejected under 35 U.S.C. §103(a) for obviousness over Nadd (*Office Action* p.7). Applicant respectfully traverses the rejection.

B. Claims 10-16, 23-28, and 31-34 are rejected under 35 U.S.C. §103(a) for obviousness over U.S. Patent No. 6,082,914 to Barrus et al. (hereinafter, “Barrus”), in view of Nadd (*Office Action* p.8). Applicant
10 respectfully traverses the rejection.

Claims 8 and 9 are allowable by virtue of their dependency upon claim 1 which is allowable over Nadd for at least the reasons described above in response to the §102 rejection of claim 1. Additionally, claims 8-9 are
15 allowable over Nadd for independent reasons. For example:

Claim 8 recites “at least a second H-bridge circuit configured to drive a second motor.” The Office recognizes that Nadd does not show a second H-bridge circuit, but rejects claim 8 stating that the duplication would be obvious to use a second H-bridge circuit to drive a second motor (*Office Action*
20 p.7). Applicant disagrees because Nadd does not teach, and the Office has not properly rejected, the combination of an ASIC comprising “a second H-bridge circuit configured to drive a second motor” (claim 8) and “a configurable first H-bridge circuit that includes ... a second configuration as discrete switches” (claim 4). Accordingly, claim 8 is allowable over Nadd and the §103 rejection
25 should be withdrawn.

Claim 9 is allowable over Nadd for reasons similar to those described above in response to the rejection of claim 8, and the §103 rejection should be withdrawn.

5 Claim 10 recites a printing device comprising a multiple H-bridge circuit including:

 a first H-bridge circuit configured to drive the first motor;

10 a second H-bridge circuit configured to drive the second motor; and

 a third H-bridge circuit that includes a first configuration as a motor drive circuit to drive a third motor, and includes a second configuration as discrete switches that are each configured to be coupled to a different component as a component switch.

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 Barrus and/or Nadd do not teach or suggest a third H-bridge circuit that includes... a second configuration as discrete switches that are each configured to be coupled to a different component as a component switch”, as recited in claim 10. The Office recognizes that Barrus does not teach the second configuration of an H-bridge circuit as discrete switches (*Office Action* p.8).

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 As described above in the response to the §102 rejection of claim 1, Nadd only describes an H-bridge circuit for a d-c motor that consists of two high side MOSFETs and two low side MOSFETs (*Nadd* Abstract; col.1, line 54 to col.2, line 10). The Office cites Nadd which indicates that an H-bridge circuit can be used in other applications, for example driving linear solenoids and other loads (*Office Action* p.8; *Nadd* col.3, lines 2-7). However, Nadd does not show or disclose a configuration in which each of the discrete switches are configured to be coupled to a different component as a component switch, as recited in claim 10.

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Accordingly, claim 10 is allowable over the Barrus-Nadd combination and Applicant respectfully requests that the §103 rejection be withdrawn.

5 Claims 11-16 are allowable by virtue of their dependency upon claim 10. Additionally, some or all of claims 11-16 are allowable over the Barrus-Nadd combination for independent reasons. For example:

10 Claim 11 recites “a configuration register configured to maintain an indicator of the third H-bridge circuit configuration as at least one of the motor drive circuit or the discrete switches”. The Office only cites the same directional motor controller (80) shown in Nadd Fig. 8, and does not cite Barrus against claim 11. As described above in the response to the rejection of claims 4 and 5, there is no indication in Nadd of a configuration register, and there is no indication that an H-Bridge circuit is configured as the discrete switches, as recited in claim 11. Accordingly, claim 11 is allowable over the
15 Barrus-Nadd combination and the §103 rejection should be withdrawn.

Claim 12 recites “a configuration register configured to maintain an indicator that the third H-bridge circuit is configured as the discrete switches”, and is similarly allowable over the Barrus-Nadd combination for the reasons that claim 11 is allowable. Accordingly, the §103 rejection of claim 12 should
20 be withdrawn.

Claims 23 and 31 are rejected along with, and for the same reasons, as claim 10 (*Office Action* p.8). For at least the reasons described above in response to the rejection of claim 10, independent claims 23 and 31 are also
25 allowable over the Barrus-Nadd combination and the §103 rejection should be withdrawn.

Claims 24-28 are allowable by virtue of their dependency upon claim 23. Additionally, some or all of claims 24-28 are allowable over the Barrus-Nadd combination for independent reasons as described above.

Claims 32-34 are allowable by virtue of their dependency upon claim 31. Additionally, some or all of claims 32-34 are allowable over the Barrus-Nadd combination for independent reasons as described above.

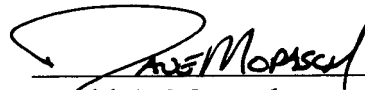
Conclusion

Pending claims 1 and 3-34 are in condition for allowance. Applicant respectfully requests reconsideration and issuance of the subject application. If any issues remain that preclude issuance of this application, the Examiner is urged to contact the undersigned attorney before issuing a subsequent Action.

Respectfully Submitted,

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